Fagus grandifolia / Carex pensylvanica - Carex brunnescens Forest

COMMON NAME	American Beech / Pennsylvania Sedge - Brown Sedge Forest
SYNONYM	Southern Appalachian Beech Gap (South Slope Sedge Type)
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Deciduous forest (I.B)
PHYSIOGNOMIC GROUP	Cold-deciduous forest (I.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural (I.B.2.N)
FORMATION	Lowland or submontane cold-deciduous forest (I.B.2.N.a)
ALLIANCE	*Betula alleghaniensis - Fagus grandifolia - Aesculus flava* Forest Alliance
CLASSIFICATION CONFIDENCE LEVEL	1
USFWS WETLAND SYSTEM	Upland

RANGE

Globally

This community is found in scattered sites on high elevations of the southern Appalachian Mountains. The majority of this community is distributed within the mountains of North Carolina, but it also occurs in Tennessee and possibly in Virginia.

Great Smoky Mountains National Park

This community was sampled from a single location on the Mount Le Conte quadrangle, on the south slope of Trillium Gap (4719 feet elevation). It was not observed on the Cades Cove quadrangle, but it does occur in other areas of the Park.

ENVIRONMENTAL DESCRIPTION

Globally

This community typically occurs on concave slopes, flat ridgetops, or upper south- to southwest-facing slopes, at elevations of greater than 1370 m (4500 feet) (Whittaker 1956; Russell 1953). High rainfall and low temperatures create mesic conditions. Strong winds and ice storms periodically damage these forests, creating canopy gaps and contributing to its stunted appearance. This community commonly occurs as small patches surrounded by other forest types, montane grasslands and shrublands.

Great Smoky Mountains National Park

The single occurrence documented on the Mount Le Conte quadrangle is on broad, flat, western-oriented saddle. The beech trees were all infected with Beech Bark Disease. The occurrence was surrounded by heath shrublands, spruce-hemlock forests, and northern hardwood forests.

MOST ABUNDANT SPECIES

Globally

Stratum	Species
Tree canopy	*Fagus grandifolia*, *Halesia tetraptera* var. *monticola*
Herbaceous	*Carex aestivalis*, *Carex brunnescens*, *Carex debilis*, *Carex intumescens*, *Carex pensylvanica*

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Stratum	Species
Tree canopy	*Fagus grandifolia*
Subcanopy	*Acer pensylvanicum*
Herbaceous	*Carex pensylvanica*

CHARACTERISTIC SPECIES

Globally

Carex aestivalis, *Carex albicans*, *Carex brunnescens*, *Ageratina altissima* var. *roanensis*, *Aster chlorolepis*, *Epifagus virginiana*

Great Smoky Mountains National Park

Fagus grandifolia, Halesia tetraptera var. monticola, Rugelia nudicaulis, Carex pensylvanica

VEGETATION DESCRIPTION

Globally

This community is a broad-leaved deciduous forest with a canopy dominated by stunted, gnarled *Fagus grandifolia*, often with

lesser amounts of *Halesia tetraptera* var. *monticola* or *Betula alleghaniensis*. Typically, there are not significant understory or shrub strata, but scattered shrubs such as *Hydrangea arborescens* may occur. Herbaceous cover is dense, often approaching 100 percent coverage, and dominated by species of *Carex* (*Carex aestivalis, Carex brunnescens, Carex debilis, Carex intumescens, Carex pensylvanica)*. Ferns and other herbs form 5-20 percent of the herbaceous cover and may include *Ageratina altissima* var. *roanensis, Anemone quinquefolia, Angelica triquinata, Arisaema triphyllum, Aster chlorolepis, Athyrium filix-femina* ssp. *asplenioides, Dryopteris campyloptera, Epifagus virginiana, Erythronium umbilicatum* ssp. *monostolum, Impatiens pallida, Medeola virginiana, Oxalis montana, Laportea canadensis, Luzula acuminata, Phacelia bipinnatifida, Phacelia fimbriata, Poa alsodes, Prenanthes altissima, Prenanthes roanensis, Rugelia nudicaulis, Solidago glomerata, Stellaria corei, Thelypteris noveboracensis,* and *Trillium erectum* (Whittaker 1956; Crandall 1958; Schafale and Weakley 1990).

Great Smoky Mountains National Park
This forest has a 10-meter canopy of *Fagus grandifolia*. The subcanopy is not well-developed, but *Acer pensylvanicum* has the highest coverage. Other species in the subcanopy include *Halesia tetraptera* var. *monticola, Picea rubens*, and *Tsuga canadensis*. The herbaceous stratum is strongly dominated by *Carex pensylvanica* (75-85 percent coverage). Other species present in minor amounts include *Ageratina altissima* var. *roanensis, Angelica triquinata, Arisaema triphyllum* ssp. *triphyllum, Aster chlorolepis, Athyrium filix-femina* ssp. *asplenioides, Brachyelytrum septentrionale, Dryopteris intermedia, Laportea canadensis, Luzula acuminata, Poa alsodes, Prenanthes* sp.*, Rubus canadensis, Rugelia nudicaulis, Solidago caesia* var. *curtisii, Stellaria pubera,* and *Viola rotundifolia*.

OTHER NOTEWORTHY SPECIES
Species found in this association that are endemic to the southern Blue Ridge or with the bulk of their worldwide distribution there include *Gentiana austromontana, Glyceria nubigena, Lilium grayi*, *Phacelia fimbriata, Platanthera grandiflora*, *Prenanthes roanensis, Stellaria corei,* and *Streptopus roseus* var. *roseus.* Animals that are found in association with this forest include Bobcat (*Lynx rufus*) and Black Bear (*Ursus americanus*). The exotic European Wild Boar (*Sus scrofa*) has become well-established in the southern Appalachian Mountains and has had negative impacts on the native animals and vegetation in this community.

CONSERVATION RANK G2

RANK JUSTIFICATION
This community has a very restricted range with scattered occurrences of small acreage. Many occurrences have been, and continue to be, severely damaged by the European Wild Boar (*Sus scrofa*). Grazing and soil disturbance by this animal reduces understory herb cover to 10-30 percent of undisturbed levels and may affect tree growth and nutrient cycling (Singer *et al.* 1984). Beech Bark Disease, a complex made up of the Beech scale insect (*Crytococcus fagisuga*) and a closely associated fungus (*Nectria coccinea* var. *faginata*), may pose a threat to this community. Another potential threat to this high elevation community is atmospheric deposition of air pollutants, which may result in tree growth decline.

DATABASE CODE CEGL006130

COMMENTS
Globally
This community is often referred to as a classic "beech gap" forest. It includes forest vegetation with short-statured canopies dominated by *Fagus grandifolia*, occurring over a dense, graminoid-dominated herbaceous stratum. This community is thought to be limited to the range of *Picea rubens* and *Abies fraseri* (Whittaker 1958). A similar community, *Fagus grandifolia / Ageratina altissima* var. *roanensis* Forest, dominated by short-stature *Fagus grandifolia,* occurring with *Betula alleghaniensis* and *Aesculus flava*, occurs on mesic, north-facing slopes in the southern Appalachian Mountains of North Carolina and Tennessee. This mesic northslope community is thought to be more similar to northern hardwood forests, having a more diverse canopy and subcanopy, and to extend farther into the southwest mountain ranges than does the south slope, sedge-dominated variant described here (Whittaker 1956). Well-developed examples of this type are quite distinct from the Typic Southern Appalachian Northern Hardwoods Forest (*Betula alleghaniensis - Fagus grandifolia - Aesculus flava / Viburnum lantanoides / Aster chlorolepis - Dryopteris intermedia* Forest – CEGL007285). However, some beech-dominated forests occurring on upper slopes may be transitional between the two types and therefore difficult to classify. *Fagus grandifolia / Carex pensylvanica - Carex brunnescens* Forest (CEGL006130) may be distinguished by its location in high elevation gaps or ridges, the stature and structure of the gnarled stunted beech trees, the absence of a dense shrub layer, and the predominance of beech in the canopy (Russell 1953).
Great Smoky Mountains National Park

REFERENCES
Bratton 1975, Crandall 1958, Davis 1930, Golden 1981, Lindsay and Bratton 1979, McLeod 1988, Pittillo and Smathers 1979, Ramseur 1960, Rheinhardt 1981, Russell 1953, Schafale and Weakley 1990, Schofield 1960, Singer et al. 1984, White et al. 1993, Whittaker 1956